

Notice of Allowability

Application No.

10/785,413

Examiner

Hai Vo

Applicant(s)

YAO ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment after final filed 05/23/2007.
2. ☒ The allowed claim(s) is/are 15 and 17-27.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/539,929.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20070530.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Gregory T. Lowen on 05/30/2007.

The application has been amended as follows:

The claims:

15. (currently amended) A porous insulating film consisting essentially of a highly heat resistant polyimide resin film having a fine porous structure wherein:

a) fine continuous channels reaching to both surfaces of the insulating film in a nonlinear fashion have a mean pore size of $0.01 - 2 \text{ } \underline{0.2} \text{ } \mu\text{m}$ in the center of the film and $0.4 - 0.9 \text{ } \mu\text{m}$ at both surfaces of the film and a porosity of 15 - 80%;

b) the polyimide resin film is prepared from a polyimide precursor solution and consists essentially of a polyimide obtained from the combination of at least one tetracarboxylic acid component and a diamine component; and

c) the insulating film has

a thickness of 5 - 150 μm ,

a resistance to passage of air of from 30 sec/100 cc to 2000 sec/100 cc,

and

a heat shrinkage of not greater than about $\pm 1\%$ after being heat-treated at 105°C for 8 hours, and

does not contain a dense layer on either of the surfaces.

21. (currently amended) A porous insulating film consisting essentially of a highly heat resistant polyimide resin film having a fine porous structure wherein:

a) fine continuous channels reaching to both surfaces of the insulating film in a nonlinear fashion have a mean pore size of $0.01 - 2 \underline{0.2} \mu\text{m}$ in the center of the film and $0.4 - 0.9 \mu\text{m}$ at both surfaces of the film; and

b) the polyimide resin film is prepared from a polyimide precursor solution and consists essentially of a polyimide obtained from the combination of at least one tetracarboxylic acid component and a diamine component; and

c) the insulating film has

a thickness of $5 - 100 \mu\text{m}$,

a resistance to passage of air of from $30 \text{ sec}/100 \text{ cc}$ to $2000 \text{ sec}/100 \text{ cc}$,

a heat resistance temperature of at least 200°C , and

a heat shrinkage of not greater than $\pm 1\%$ after being heat-treated at 105°C for 8 hours, and

does not contain a dense layer on either of the surfaces.

Cancel claim 16.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Note that Applicants' amendment and Examiner's amendment are sufficient to overcome the 112

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claim rejections and the art rejections and sufficient to place the claims in condition for allowance.

Saunders teaches a polyimide film useful as a dielectric layer for semiconductor devices (abstract). Saunders teaches the porous film having a porosity of 68%, thickness of 22 microns, an average pore size ranging from 4.5 to 0.5 μm , and a dielectric constant of 1.88. Saunders does not teach a porous film having a mean pore size of 0.01- 0.2 μm in the center of the film and 0.4 - 0.9 μm at both surfaces of the film. There is no motivation to combine Saunders with other references to achieve that feature.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HV

Date: May 30, 2007

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